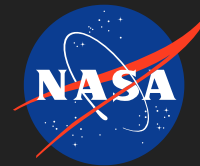


## Compact High Pulse Energy Single Frequency Fiber Amplifier, Phase II

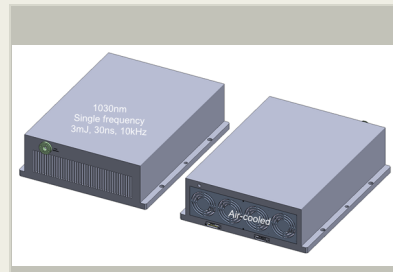
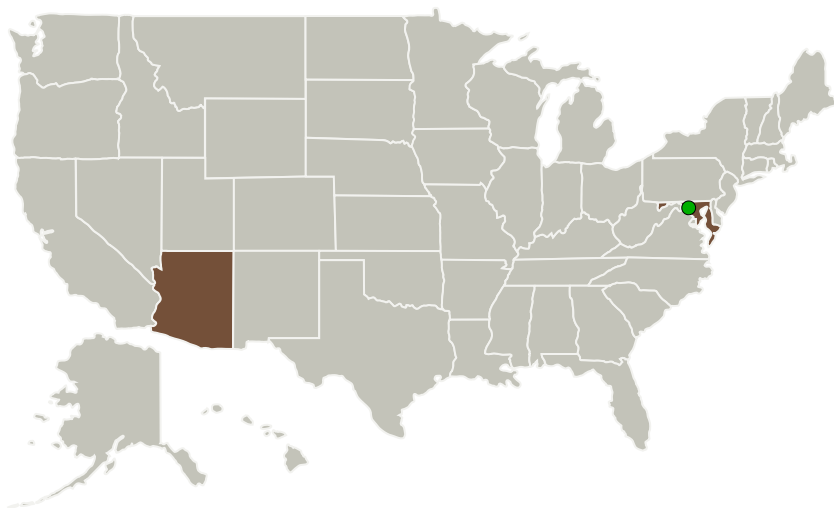


Completed Technology Project (2017 - 2019)

## Project Introduction

Atmospheric methane is the second most important anthropogenic greenhouse gas. The overtone lines of methane at 1.65 micron are well suited for remote sensing of atmospheric methane in the Earth's atmosphere. NASA have already demonstrated ground-based and airborne methane detection using Optical Parametric Amplifiers at 1651 nm using a laser with a narrow linewidth. In this setup a single frequency pulsed laser near 1 micron wavelength with several mJ pulse energy is needed. We propose to develop a compact pulsed single frequency fiber laser with greater than 3mJ pulse energy and 30ns pulse width using our innovative Yb-doping fiber. Highly efficient Yb doped glasses will be developed, double cladding fibers will be designed and fabricated, the amplifier performance will be characterized. In Phase II we will build a deliverable prototype high energy and high peak power fiber laser system for NASA.

## Primary U.S. Work Locations and Key Partners



Compact High Pulse Energy Single Frequency Fiber Amplifier, Phase II Briefing Chart Image

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## Compact High Pulse Energy Single Frequency Fiber Amplifier, Phase II



Completed Technology Project (2017 - 2019)

Organizations Performing Work	Role	Type	Location
AdValue Photonics, Inc.	Lead Organization	Industry Small Disadvantaged Business (SDB)	Tucson, Arizona
● Goddard Space Flight Center(GSFC)	Supporting Organization	NASA Center	Greenbelt, Maryland

## Primary U.S. Work Locations

Arizona	Maryland
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## Project Transitions

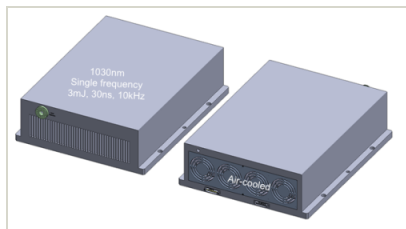
▶ **April 2017:** Project Start

✓ **April 2019:** Closed out

## Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/140822>)

## Images



## Briefing Chart Image

Compact High Pulse Energy Single Frequency Fiber Amplifier, Phase II Briefing Chart Image (<https://techport.nasa.gov/image/126830>)



## Final Summary Chart Image

Compact High Pulse Energy Single Frequency Fiber Amplifier, Phase II (<https://techport.nasa.gov/image/125815>)

## Organizational Responsibility

## Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

## Lead Organization:

AdValue Photonics, Inc.

## Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

## Project Management

## Program Director:

Jason L Kessler

## Program Manager:

Carlos Torrez

## Principal Investigator:

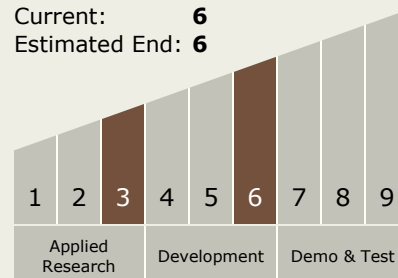
Shibin S Jiang

## Technology Maturity (TRL)

Start: 3

Current: 6

Estimated End: 6



# Compact High Pulse Energy Single Frequency Fiber Amplifier, Phase II

Completed Technology Project (2017 - 2019)



## Technology Areas

### Primary:

- TX08 Sensors and Instruments
  - └ TX08.1 Remote Sensing Instruments/Sensors
    - └ TX08.1.5 Lasers

## Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System